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A Study for the Use of Telemedicine/Teleradiology in the Initial Management of Acute Stroke

Stroke is the leading cause of disability and the third leading cause of death in the United States. The statement, "Time is Brain", emphasizes the most critical aspect of urgent stroke care, which is constrained by a narrow, three hour therapeutic window for treatment with intravenous recombinant tissue plasminogen activator (IV rt-PA), the "brain saving" drug. Using IV rt-PA requires a rapid and organized approach. The purpose of this study is to test the feasibility of using telemedicine technology for consultations in the diagnosis of stroke, by validating a telemedicine procedure within the critical time frame.

Analysis of Phase I data suggests that "tele-stroke" consultation can be performed in a timely fashion. During this phase the investigators measured how long it took providers to complete a stroke consultation. The goal was to compare evaluations of a conventional, "in-person" patient/physician interaction to the telemedicine physician evaluation. For both interventions the neurological stroke examination consisted of a set of standardized patient history questions, the National Institutes of Health Stroke Scale (NIHSS), patient laboratory values and brain CT scans. Telemedicine patient evaluation questions were prompted by an MS ACCESS database "front-end" data presentation on screen simultaneously with a PictureTel PT-680 video teleconference (VTC). The VTC units use the H.320 protocol allowing for remote camera control. DICOM data can be transmitted securely using a SOHO Router and point-to-point tunneling protocol.

In addition to measuring intervention time, comparison of final diagnosis between the "in-person" and "telemedicine" providers will be included as an end-point in the next phase of this study. For this purpose, a web based stroke assessment for use by the remote study personnel was designed. The web site contains pertinent history questions, the NIHSS, and a stroke management checklist. The target remote site is Dewitt Army Community Hospital Emergency Department at Ft. Belvoir, VA. Further remote sites for Phase II include Ft. Bragg, NC; Ft. Campbell, KY; and Portsmouth Naval Hospital, VA.

The preliminary results of Phase I suggest that telemedicine technology can provide a valid clinical tool for immediate remote assessment and consultation by stroke experts. Rural areas in the United States and the US military medical system will benefit from a remote tele-stroke system. The ability to provide immediate expert consultation on patients will improve the quality of life for stroke patients and at the same time will reduce healthcare expenses.

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